Exhaust System, Emission Controls - 2.0L New Beetle (AEG, AVH, AZG, BDC, BEV & BGD)

EXHAUST SYSTEM COMPONENTS, REMOVING AND INSTALLING

NOTE:

- **After working on the exhaust system ensure that the system is not under stress, and that it has sufficient clearance to the bodywork. If necessary, loosen double clamp(s) and align muffler and exhaust pipe so that sufficient clearance is maintained to the bodywork and the support rings are evenly loaded.**
- **Replace self-locking nuts.**

Special tools, equipment, testers, measuring instruments and auxiliary items required

- 3337 Ring spanner for oxygen sensor
- V.A.G 1331 Torque wrench (5...50 N.m)
- V.A.G 1332 Torque wrench (40...200 N.m)

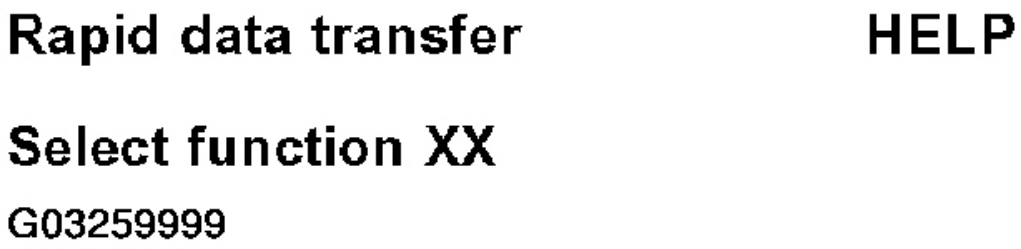

Fig. 1: Identifying Exhaust System Special Tools And Measuring Instruments
Courtesy of VOLKSWAGEN OF AMERICA, INC.

EXHAUST MANIFOLD, FRONT EXHAUST PIPE AND CATALYTIC CONVERTER WITH ATTACHMENTS

Engine code: AEG

- Engine codes AVH, AZG, BDC, BEV, BGD. See **ENGINE CODES AVH, AZG, BDC, BEV, BGD** .

NOTE: **The following list refers to items in Fig. 2 .**

1. **Combination valve**
   - Checking. See **COMBINATION VALVE, CHECKING**
   - Removing and installing. See **COMBINATION VALVE, REMOVING AND INSTALLING**
2. **10 N.m**
3. **25 N.m**
4. **40 N.m**
5. **25 N.m**
   - Replace
6. **Connecting pipe**
   - For secondary air inlet
7. **Nuts/bolts, 60 N.m**
8. **Connector**
   - Black, 6-pin
   - Gold plated contacts
   - For oxygen and oxygen sensor heating
9. **Heated Oxygen Sensor (HO2S) -G39-**
   - 50 N.m
   - Grease only threads with hot bolt paste G 052 112 A3. Paste must not get into slots on sensor body
   - Remove and install with 3337
10. **Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-**
    - 50 N.m
    - Grease only threads with hot bolt paste G 052 112 A3. Paste must not get into slots on sensor body
    - Remove and install with 3337
11. **4-pin connector**
    - Brown
    - Contacts 3 and 4 are gold plated
    - For oxygen and oxygen sensor heating
12. **To center muffler**
13. **Front exhaust pipe with catalytic converter**
14. **40 N.m**
    - Replace
15. **Support**
16. **Seal**
    - Replace
17. **Exhaust manifold**
    - Removing and installing. See **MUFFLER, REMOVING AND INSTALLING**
18. **Warm air collector plate**

Rapid data transfer HELP

Select function XX

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Fig. 2: Removing And Installing Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter (Engine Code AEG)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Engine codes AVH, AZG, BDC, BEV, BGD

NOTE: The following list refers to items in Fig. 3 .

1. **Warm air collector plate**
   - With intake manifold support
   - With mounting for combination valve
2. **Heated Oxygen Sensor (HO2S) -G39-**
   - 50 N.m
   - Grease only threads with hot bolt paste G 052 112 A3. Paste must not get into slots on sensor body
   - Remove and install with 3337
3. **Connector**
   - Black, 6-pin
   - Gold plated contacts
   - For oxygen and oxygen sensor heating
4. **Combination valve**
   - Checking. See **COMBINATION VALVE, CHECKING**
   - Removing and installing. See **COMBINATION VALVE, REMOVING AND INSTALLING**
5. **10 N.m**
6. **25 N.m**
7. **25 N.m**
   - Replace
8. **40 N.m**
9. **Connecting pipe**

- For secondary air inlet

10. **Bolts, 60 N.m**
11. **25 N.m**
12. **Retainer**
13. **Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC)-G130-**
    - 50 N.m
    - Grease only threads with hot bolt paste G 052 112 A3. Paste must not get into slots on sensor body
    - Remove and install with 3337
14. **4-pin connector**
    - Brown
    - Contacts 3 and 4 are gold plated
    - For oxygen and oxygen sensor heating
15. **Front exhaust pipe with catalytic converter**
    - With anti-vibration element
16. **10 N.m**
17. **To center muffler**
18. **Heat shield**
    - For catalytic converter
19. **5 N.m**
20. **Speed nut**
    - Install from rear and press forward onto limit stop
21. **25 N.m**
    - Replace
22. **Seal**
    - Replace
23. **Exhaust manifold**
    - Removing and installing. See **MUFFLER, REMOVING AND INSTALLING**
24. **Seal**
    - Replace

Rapid data transfer Q

02 - Interrogate fault memory

G03260001

Fig. 3: Removing And Installing Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter (Engine Codes AVH, AZG, BDC, BEV And BGD)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MUFFLER WITH MOUNTINGS

NOTE: The following list refers to items in Fig. 4 .

1. **From catalytic converter**
2. **Double clamp**
   - Observe installing position. See **Installation Position Of Double Clamp**
3. **25 N.m**
4. **Hangers/mountings**
   - Observe installed position. See **Installation Position Of Mounting**
5. **Forward muffler**
   - Aligning. See **Aligning Center Muffler Stress Free**
6. **Separating point**
   - For repair cases
   - As standard, front and rear mufflers are installed as a single component. In repair cases front and rear mufflers are supplied individually with a double clamp for connecting together.
   - Cut through connecting pipe with body saw e.g. V.A.G 1523 at right angles at separating point. See **Separating point on exhaust pipe**
7. **20 N.m**
8. **Hangers/mountings**
9. **Rear muffler**
10. **Hangers/mountings**
    - With retaining ring
11. **Tunnel bridge**

12. **40 N.m**

Fig. 4: Removing And Installing Muffler With Mounting
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installation Position Of Double Clamp

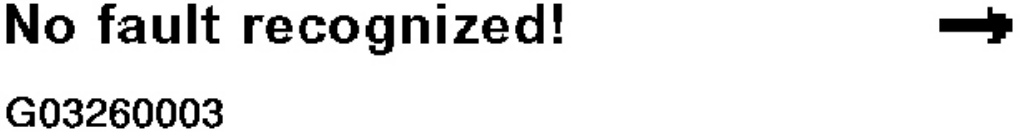

Fig. 5: Identifying Installation Position Of Double Clamp
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Work sequence

- Position double clamp approx. 5 mm away from mark "A" (arrow -2-).

NOTE:

- **Mark "A" (arrow -2-) is valid for models with either a manual or an automatic transmission.**
- **Mark "S" (arrow -1-) is not valid for the engine codes in this manual.**

Installation Position Of Mounting

Angled side on base of mounting (arrow) points forward.

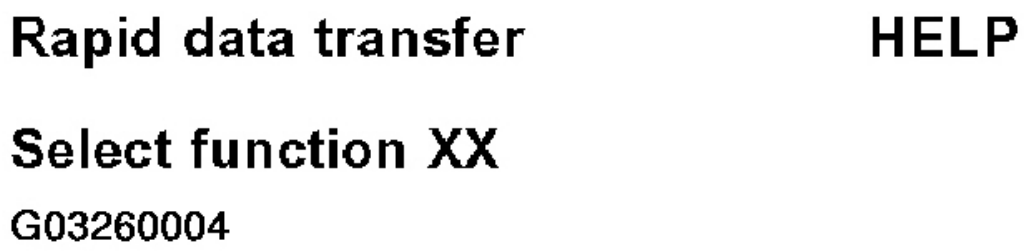

Fig. 6: Identifying Installation Position Of Mounting
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Separating point on exhaust pipe

Special tools, equipment, testers, measuring instruments and auxiliary items required

- Body saw e.g. V.A.G 1523

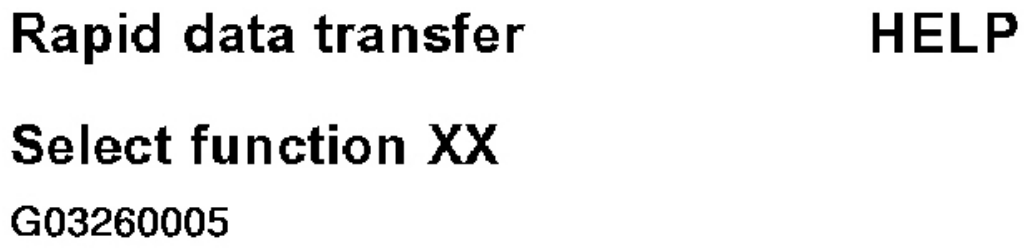

Fig. 7: Identifying Separating Point On Exhaust Pipe
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Work sequence

- Separate exhaust pipe at right angles at separating point (arrow -2-).
- When installing, position repair double clamp -4- at side markings (arrows -1- and -3-). Tighten torque: 40 N.m

Aligning Center Muffler Stress Free

The mounting pins on the exhaust pipe must run parallel with the tunnel bridge (dimension -x- on left and right is the same).

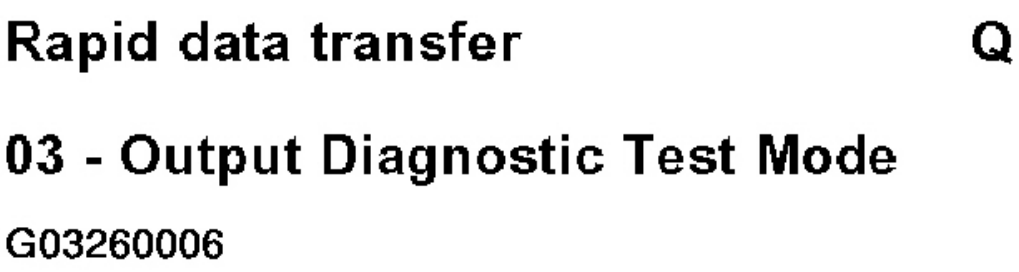

Fig. 8: Aligning Center Muffler Stress Free
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MUFFLER, REMOVING AND INSTALLING

Special tools, equipment, testers, measuring instruments and auxiliary items required

- V.A.G 1331 Torque wrench (5...50 N.m)

Removing

- Remove engine cover.
- Unscrew wiper arms (M8 hex nuts = 20 N.m).

  See **WIPER ARMS** .

- Remove plenum chamber cover (outer) and plenum chamber sealing part.

Fig. 9: Identifying V.A.G 1331 Torque Wrench
Courtesy of VOLKSWAGEN OF AMERICA, INC.

See **PLENUM CHAMBER SEALING ASSEMBLY, REMOVING AND INSTALLING** .

- Remove intake manifold upper part: See **INTAKE MANIFOLD UPPER PART, REMOVING AND INSTALLING** .

NOTE: Seal the intake ports in the intake manifold lower part with clean cloths.

- Pull pressure and vacuum hoses off combination valve.
- Remove connecting pipe between combination valve and exhaust manifold.
- Remove insulation tray.

See **NOISE INSULATION, ASSEMBLY OVERVIEW** .

- Remove right hand inner constant velocity joint protective cover from engine if installed.
- Remove engine/exhaust manifold support.
- Disconnect connector for oxygen sensor -1- and move wiring clear.

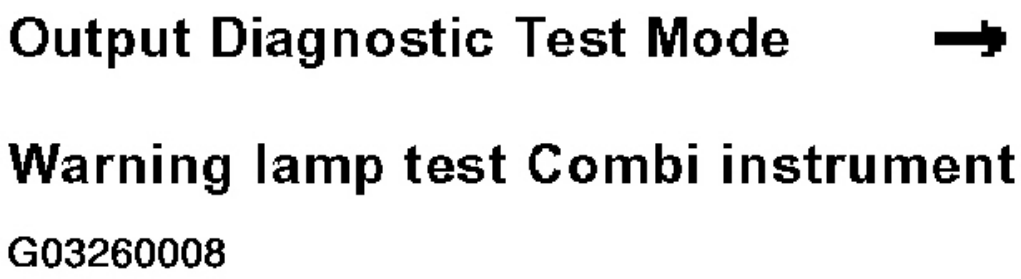

Fig. 10: Disconnecting Connector From Oxygen Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove warm air collector plate.
- Remove securing bolts -2- from exhaust pipe on exhaust manifold.

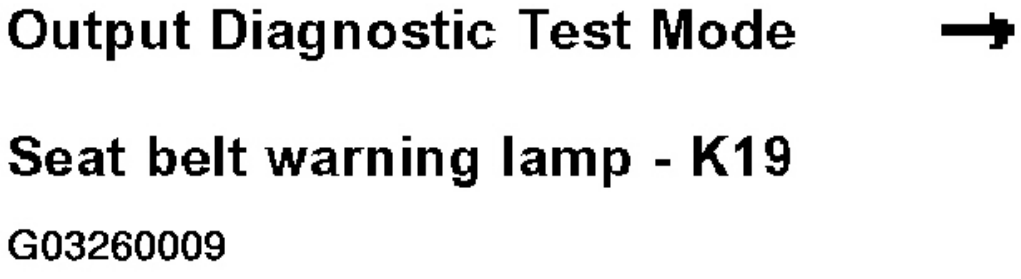

Fig. 11: Removing Securing Bolts From Exhaust Pipe On Exhaust Manifold
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Unbolt four upper nuts -1- as well as four lower from exhaust manifold to cylinder head.
- Remove exhaust manifold upward.

Installing

NOTE:

- **To prevent exhaust gases escaping, the contact surfaces between the exhaust manifold, exhaust pipe and cylinder head must be bolted together correctly.**

- **Replace all seals/gaskets and self-locking nuts.**

Installation is performed in the reverse sequence. Note the following:

- Tightening torques. See **EXHAUST MANIFOLD, FRONT EXHAUST PIPE AND CATALYTIC CONVERTER WITH ATTACHMENTS** and **ENGINE CODES AVH, AZG, BDC, BEV, BGD**
  - Erase fault memory. See **ENGINE CONTROL MODULE FAULT MEMORY, INTERROGATION AND ERASING** .

SECONDARY AIR SYSTEM

WARNING: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- **Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.**
- **Ensure sufficient clearance to all moving or hot components.**

FUNCTION

- The secondary air system blows air in behind the exhaust valve for a maximum of 100 seconds after the cold start (+5° C...+33° C coolant temperature). This produces an oxygen rich exhaust gas which initiates afterburning and reduces the heating-up phase of the catalytic converter.
- Activation occurs from Motronic Engine Control Module (ECM) -J220- via the Secondary Air Injection (AIR) pump relay -J229- to Secondary Air Injection (AIR) solenoid valve -N112-, change-over valve and combination valve. Only vehicles with engine code AEG up to Model Year 1999, 05.99.
- If the secondary air pump motor is activated it produces an overpressure and opens the combination valve at 60 to 70 mbar. Only vehicles with engine codes: AEG as of Model Year 1999, 06.99, AVH, AZG, BDC, BEV and BGD.
- Additionally after each subsequent engine start (up to max. 96 °C engine temperature) the secondary air system will switch in for 10 seconds during idling and will be checked by the self-diagnosis. When doing this the oxygen sensor regulation must be active.

SECONDARY AIR SYSTEM COMPONENTS, REMOVING AND INSTALLING

Engine codes AEG up to Model Year 1999, 05.99

- Engine codes: AEG as of Model Year 1999, 06.99, AVH, AZG, BEV. See **ENGINE CODES: AEG AS OF MODEL YEAR 1999 (06.99) - AVH, AZG AND BEV** .
- Engine codes BDC, BGD. See **ENGINE CODES: BDC, BGD** .

NOTE: The following list refers to items in Fig. 12 .

1. **Connector**
   - 2-pin
2. **Secondary Air Injection (AIR) solenoid valve -N112-**
3. **To union on pipe to brake servo**
4. **Secondary Air Injection (AIR) pump relay -J299-**
   - In protective housing for relays. See **Secondary Air Injection (AIR) pump relay -J299-**
   - In engine compartment (in cable guide next to brake master cylinder)
5. **O-ring**
   - Replace
6. **Pressure hose**
   - Check if seated securely
   - Press together at front to release
7. **Intake hose**
   - From air cleaner upper part
   - For secondary air injection pump
   - Check if seated securely
   - Press together at front to release
8. **Secondary Air Injection (AIR) pump motor -V101-**
   - Activation via AIR pump relay -J299-
   - Checking function. See **SECONDARY AIR INJECTION PUMP MOTOR, CHECKING**
9. **10 N.m**
10. **Retainer**
    - For secondary air pump motor
    - Fastened to intake manifold
11. **Connector**
    - 2-pin
12. **25 N.m**
13. **Intake manifold lower part**
14. **To union on exhaust manifold**
15. **40 N.m**
16. **Connecting pipe**
17. **Nuts/bolts, 60 N.m**
18. **Warm air collector plate**
    - With mounting for combination valve
19. **Seal**
    - Replace
20. **Combination valve**

- Checking. See **COMBINATION VALVE, CHECKING**
- Removing and installing. See **COMBINATION VALVE, REMOVING AND INSTALLING**

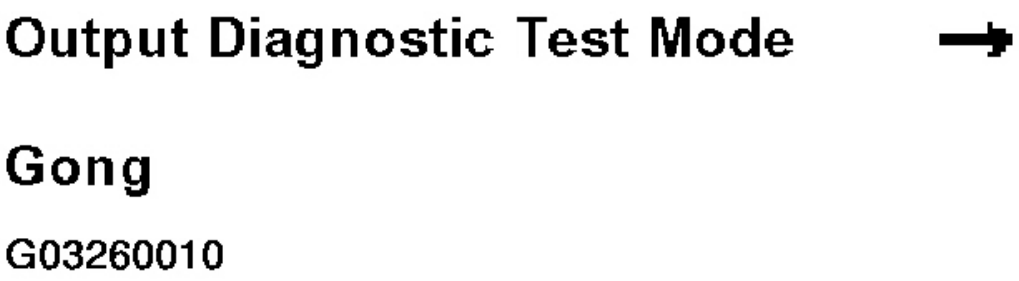

Fig. 12: Exploded View Of Secondary Air System Components
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Engine codes: AEG as of Model Year 1999 (06.99) - AVH, AZG and BEV

NOTE: The following list refers to items in Fig. 13 .

1. **Combination valve**
   - Checking. See **COMBINATION VALVE, CHECKING**
   - Removing and installing. See **COMBINATION VALVE, REMOVING AND INSTALLING**
2. **Secondary Air Injection (AIR) pump relay -J299-**
   - In protective housing for relays. See **Secondary Air Injection (AIR) pump relay -J299-**
   - In engine compartment (in cable guide next to brake master cylinder)
3. **O-ring**
   - Replace
4. **Pressure hose**
   - Check if seated securely
   - Press together at front to release
5. **Intake hose**
   - From air cleaner upper part
   - For secondary air injection pump
   - Check if seated securely
   - Press together at front to release
6. **Secondary Air Injection (AIR) pump motor -V101-**

- Activation via AIR pump relay -J299-
- Checking function. See **SECONDARY AIR INJECTION PUMP MOTOR, CHECKING**

7. **10 N.m**
8. **Retainer**
    - For secondary air injection pump motor
    - Fastened to intake manifold
9. **Connector**
    - 2-pin
10. **25 N.m**
11. **Intake manifold lower part**
12. **To union on exhaust manifold**
13. **40 N.m**
14. **Connecting pipe**
15. **Nuts/bolts, 60 N.m**
16. **Warm air collector plate**
    - With mounting for combination valve
17. **Seal**
    - Replace

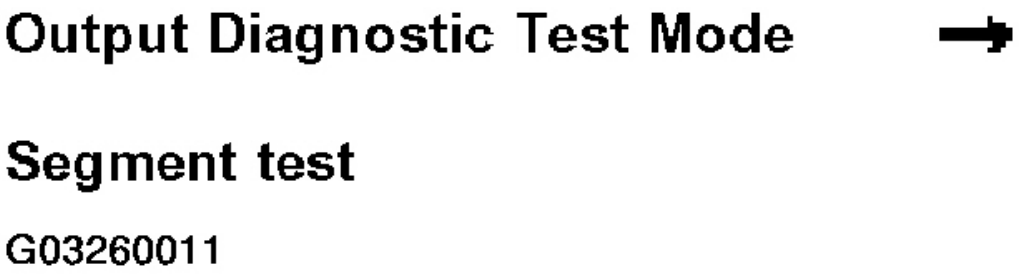

Fig. 13: Exploded View Of Secondary Air Injection (AIR) Pump Motor (Engine Code AEG)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Engine codes: BDC, BGD

NOTE: The following list refers to items in Fig. 14 .

1. **Combination valve**

- Checking. See **COMBINATION VALVE, CHECKING**
- To replace, remove warm air collector plate
- Removing and installing. See **COMBINATION VALVE, REMOVING AND INSTALLING**

2. **O-ring**
   - Replace
3. **Pressure hose**
   - Check if seated securely
   - Press together at front to release
4. **Intake hose**
   - For secondary air injection pump
   - Check if seated securely
   - Press together at front to release
5. **To air cleaner**
6. **Secondary Air Injection (AIR) pump motor -V101-**
   - Activation via AIR pump relay -J299-. See **Secondary Air Injection (AIR) pump relay -J299-**
   - Checking function. See **SECONDARY AIR INJECTION PUMP MOTOR, CHECKING**
7. **Connector**
   - 2-pin
8. **10 N.m**
9. **25 N.m**
10. **15 N.m**
11. **Retainer**
    - For secondary air injection pump motor
    - Secured to intake manifold
12. **Intake manifold lower part**
13. **10 N.m**
14. **To union on exhaust manifold**
15. **40 N.m**
16. **Connecting pipe**
17. **Nuts/bolts, 60 N.m**
18. **Warm air collector plate**
    - With intake manifold support
    - With mounting for combination valve
19. **Seal**
    - Replace

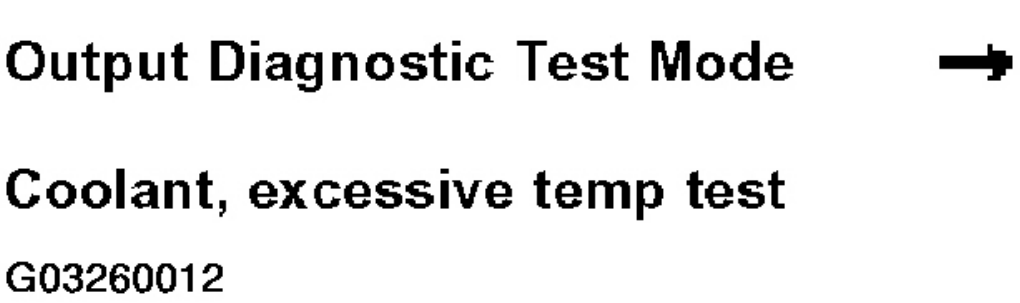

Fig. 14: Exploded View Of Secondary Air Injection (AIR) Pump Motor (Engine Codes BDC And BGD)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Secondary Air Injection (AIR) pump relay -J299-

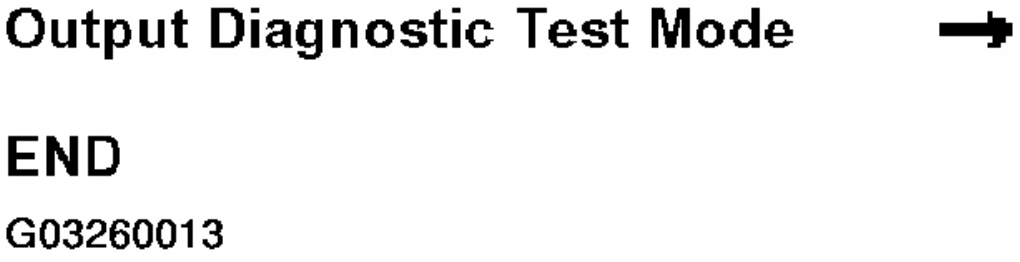

Fig. 15: Identifying Secondary Air Injection (AIR) Pump Relay
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Location: in protective housing for relays in engine compartment (pushed into cable guide next to brake master cylinder).

Distinguishing features: Control number 100

NOTE:

- **The relay locations may differ depending on the level of vehicle equipment. For the latest control numbers and installation locations:**

  See appropriate WIRING DIAGRAMS articles.

- **Disconnect the battery Ground strap first if tools are required to pull relays or control modules out of the relay plate.**
- **Before disconnecting the battery Ground strap obtain the code for radios with anti-theft coding.**

COMBINATION VALVE, CHECKING

Checking combination valve with vacuum connection, up to Model Year 1999, 05.99

Checking combination valve without vacuum connection, from Model Year 2000, 06.99. See **CHECKING COMBINATION VALVE WITHOUT VACUUM CONNECTION, FROM MODEL YEAR 2000, 06.99**

Special tools, equipment, testers, measuring instruments and auxiliary items required

- V.A.G 1390 Hand vacuum pump

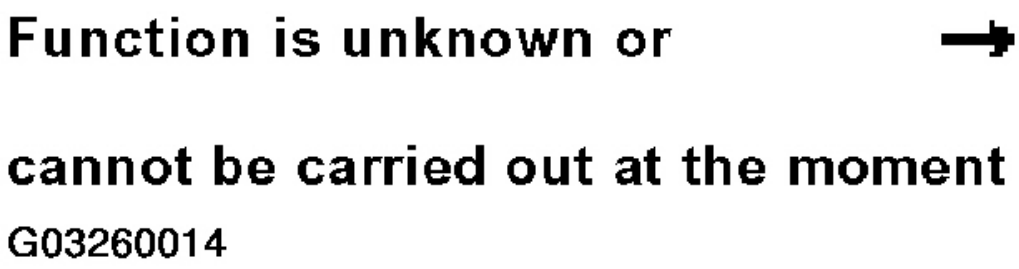

Fig. 16: Identifying V.A.G 1390 Hand Vacuum Pump
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Requirements

- No fault stored in fault memory. See **ENGINE CONTROL MODULE FAULT MEMORY, INTERROGATION AND ERASING** .
- Perform final control diagnosis. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
- Vacuum lines and hose connections free of leaks.
- Vacuum lines not blocked/kinked.

Work sequence

- Remove engine cover.
- Pull vacuum hose -1- off at Secondary Air Injection (AIR) solenoid valve -N112- -2-.

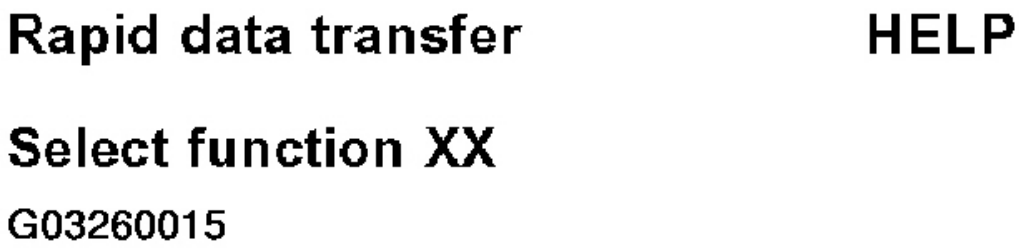

Fig. 17: Pulling Vacuum Hose From Secondary Air Injection (AIR) Solenoid Valve
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect hand vacuum pump V.A.G 1390 to vacuum hose -1-.

NOTE: Do not use compressed air during the following check!

- Remove pressure hose at secondary air pump motor and blow in lightly (arrow).
  - Combination valve must be closed
- Operate hand vacuum pump.
  - Combination valve must open

If the combination valve does not open:

- Replace combination valve.

Checking combination valve without vacuum connection, from Model Year 2000, 06.99

Requirements

- No fault stored in fault memory. See **ENGINE CONTROL MODULE FAULT MEMORY, INTERROGATION AND ERASING** .
- Perform final control diagnosis. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
- Hose unions must not leak

Work sequence

NOTE: Do not use compressed air during the following check!

- Remove engine cover.
- Remove pressure hose (arrow) from secondary air injection pump motor.

NOTE: To release, press buttons together on hose coupling.

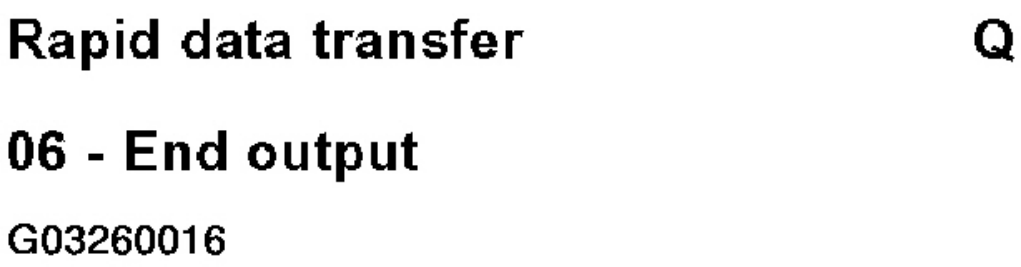

Fig. 18: Removing Pressure Hose From Secondary Air Injection Pump Motor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Blow lightly into pressure hose to combination valve.
  - Combination valve must be closed.
- Blow strongly into pressure hose to combination valve.
  - Combination valve must open.

When the combination valve does not open or is continuously open:

- Replace combination valve.

COMBINATION VALVE, REMOVING AND INSTALLING

Special tools, equipment, testers, measuring instruments and auxiliary items required

- V.A.G 1331 Torque wrench (5...50 N.m)

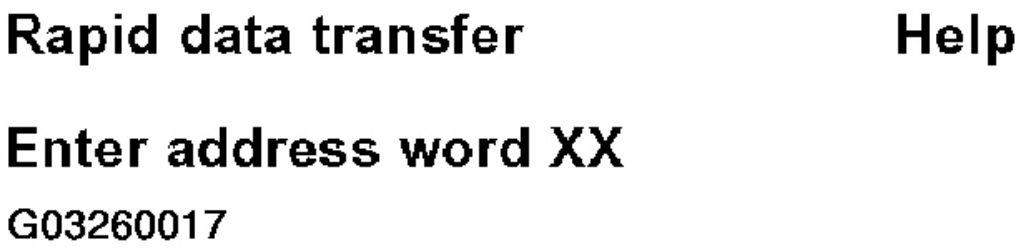

Fig. 19: Identifying V.A.G 1331 Torque Wrench
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- VAS 5085 Step ladder

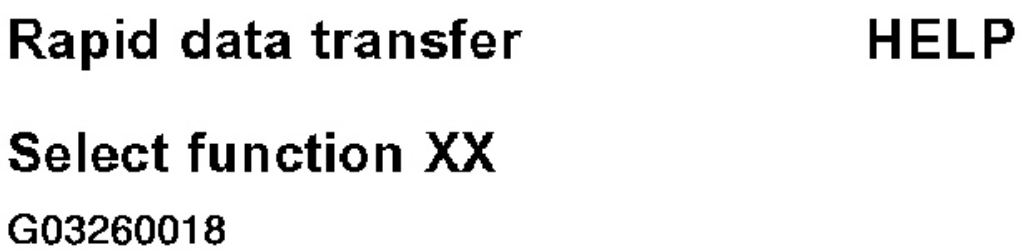

Fig. 20: Identifying VAS 5085 Step Ladder
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: Always replace seals, gaskets and O-rings.

Removing

From above:

- Remove engine cover.
- Remove intake manifold upper part. See **INTAKE MANIFOLD UPPER PART, REMOVING AND INSTALLING** .
- Pull pressure and vacuum hoses off combination valve.
- Loosen screwed on connections on connection pipe and remove pipe.

From below:

- Remove middle insulation tray.

  See **NOISE INSULATION, ASSEMBLY OVERVIEW** .

- Disconnect connector for Heated Oxygen Sensor (HO2S) -G39-.
- Remove right side inner constant velocity joint protective cover from engine if installed.
- Unbolt connecting pipe on exhaust manifold.
- Remove warm air collector plate with combination valve.

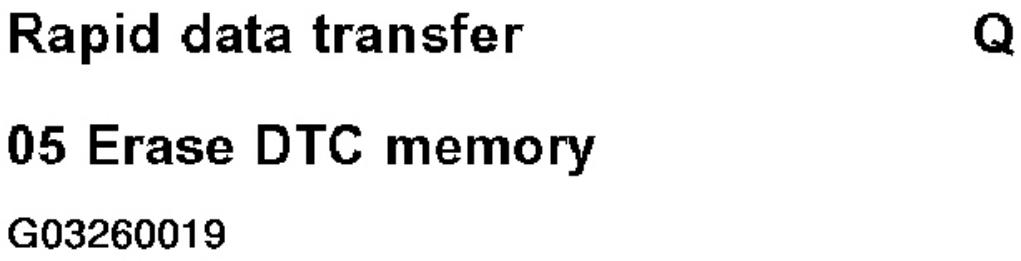

Fig. 21: Removing Warm Air Collector Plate With Combination Valve
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Guide a 5 mm hex bit from 3/8"drive socket set into holes -3- of warm air collector plate -1- and remove bolts -4- for combination valve -2-.
- Remove combination valve.

Installing

NOTE:

- **Thoroughly clean contact surfaces between combination valve and warm air collector plate.**
- **Replace seal.**

The rest of the assembly is basically in reverse order to the disassembly sequence.

SECONDARY AIR INJECTION PUMP MOTOR, CHECKING

Requirements

- No fault stored in fault memory. See **ENGINE CONTROL MODULE FAULT MEMORY,**

INTERROGATION AND ERASING .

- Fuse for Secondary Air Injection (AIR) pump relay -J299- located in the main fuse box on the battery is OK.

Fig. 22: Identifying Fuses Of Secondary Air Injection (AIR) Pump Relay Located In Main Fuse Box
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Secondary air injection pump vacuum lines and hose connections free of leaks.
- Secondary air injection pump vacuum lines not blocked/kinked.

Work sequence

- Remove engine cover.
- Remove pressure hose (arrow) from secondary air injection pump motor.

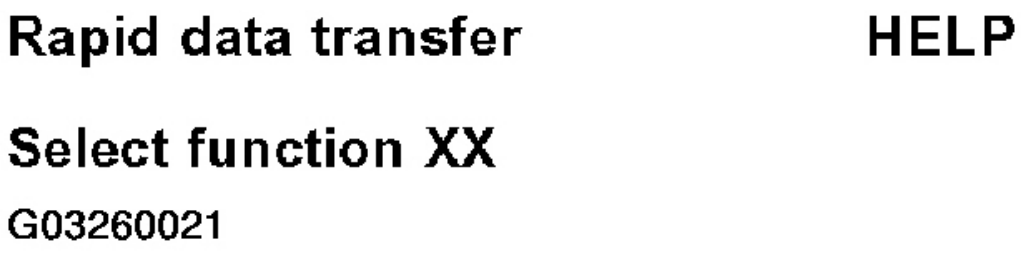

Fig. 23: Removing Pressure Hose From Secondary Air Injection Pump Motor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: To release, press buttons together on hose coupling.

- Activate secondary air injection pump relay via final control diagnosis. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
  - Secondary air injection pump motor must run and air must exit outlet connection

If the motor runs, but no air exits:

- Replace secondary air injection pump motor.

If the secondary air injection pump motor does not run at intervals:

- Activate secondary air injection pump relay via final control diagnosis. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
- Check activation of secondary air injection pump motor. See **COMPONENTS AND FUNCTIONS, ADAPTING** .

SECONDARY AIR INJECTION SOLENOID VALVE, CHECKING

Only engine code AEG up to Model Year 1999, 05.99

Special tools, equipment, testers, measuring instruments and auxiliary items required

- Adapter set V.A.G 1594

Fig. 24: Identifying Adapter Set V.A.G 1594
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1527 B Diode test lamp
- Wiring diagram

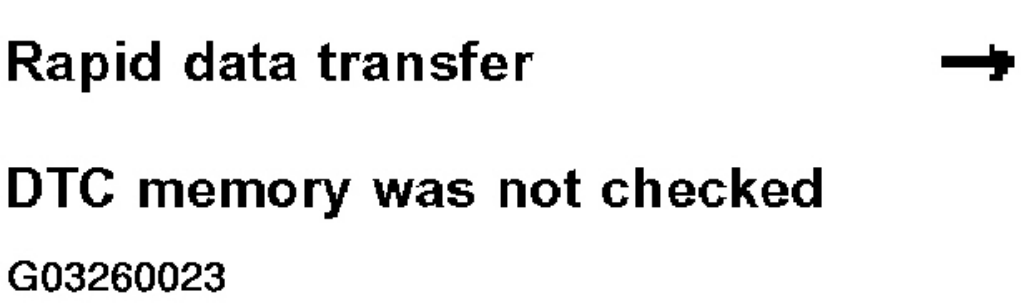

Fig. 25: Identifying V.A.G 1527 B Diode Test Lamp
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Requirements

- Coolant temperature 5...33° C
- Secondary air injection pump motor OK

Work sequence

- Pull upper vacuum hose (arrow) off secondary air injection solenoid valve -1-.

Fig. 26: Disconnecting Upper Vacuum Hose From Secondary Air Injection Solenoid Valve
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Start engine and run at idling speed.
  - When secondary air injection pump motor runs, a vacuum must be detectable at secondary air injection pump union.

If a vacuum cannot be detected:

- Switch off ignition.
- Disconnect 2-pin connector from secondary air injection solenoid valve.
- Connect diode test lamp V.A.G 1527 B to disconnected connector using adapter cables from V.A.G 1594 C.

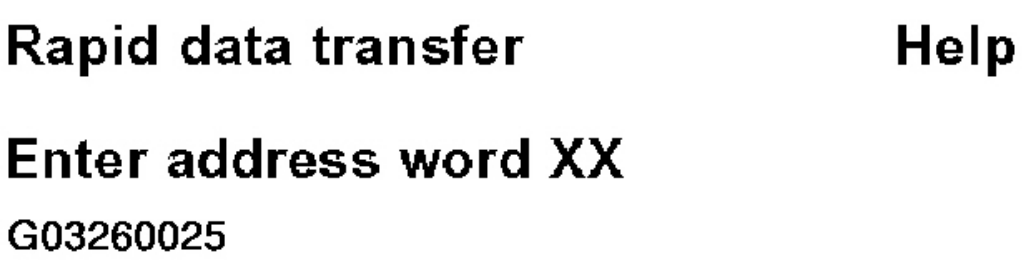

Fig. 27: Connecting Diode Test Lamp V.A.G 1527 B To Disconnected Secondary Air Injection Solenoid Valve Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Start engine and run at idling speed.
  - LED must light up

LED lights up (voltage supply OK):

- Replace secondary air injection solenoid valve.

LED does not light up:

- Connect 2-pin connector.
- Check activation of valve. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
- Check wiring connections plate according to wiring diagram.

  See appropriate WIRING DIAGRAMS article.

- Interrogate fault memory. See **ENGINE CONTROL MODULE FAULT MEMORY, INTERROGATION AND ERASING** .
- Read readiness code. See **COMPONENTS AND FUNCTIONS, ADAPTING** .
- If fault memory has been erased or engine control module separated from permanent positive power supply, generate readiness code again. See **COMPONENTS AND FUNCTIONS, ADAPTING** .